

THE WAGNER FREE INSTITUTE OF SCIENCE

Winter 2018
PHYSICAL SCIENCES SERIES
New Topics in Contemporary Physics
Professor Paul J. Angiolillo

This course will be held at the **Falls of Schuylkill Branch of the Free Library**, 3501 Midvale Avenue (at Warden Drive), Philadelphia, PA

6 Mondays from January 22 – March 5, 2018

LECTURES ARE HELD FROM 6:30 to 7:45 PM

Course Description

The last 50 years has witnessed an explosion in almost every branch of physics. Over the past ten years, the science of physics has found unequivocal evidence of the Higgs boson, uncovered that neutrinos have mass, found hundreds of extrasolar planets, and discovered exotic states of matter, to name a few. Professor Angiolillo, a materials physicist whose area of research is organic semiconductor and conducting materials, will take you on a tour of some of these recent discoveries. The historical evolution leading up to these discoveries and their Philadelphia connection, where appropriate, will comprise a significant part of the presentations. It will include areas not discussed in the 2017 course.

Course Schedule

1. Monday, January 22, 2018 – Gravity Waves

This class will explore the very recent discoveries of gravity waves. A historical tour will start, naturally, with Einstein and end with the latest events.

2. Monday, January 29, 2018 – What's New with Antimatter?

This presentation will provide an overview of the particle zoo as it stands in 2017, and then quickly focus on the nature of antimatter.

3. Monday, February 5, 2018 - Exoplanets

This lecture and discussion will focus on the continually advancing area of exoplanet hunting. The class will review the methods for exoplanet detection and discuss the possibility for life on those planets.

4. Monday, February 12, 2018 – Geometry and Nature

There is an intimate relationship between geometry and all the sciences. This discussion will highlight several examples from different areas of physics, chemistry and biology and show how geometry and symmetry dictate certain phenomena.

NO CLASS – Monday, February 19, 2018 – President's Day

5. Monday, February 26, 2018 - Physics and Biology – Historical and Recent Developments

The 21st Century will see great advancement in understanding the complexity of biological organisms. The science of biophysics will be discussed. Its historical roots leading up to recent advances will be explored, with a focus on the Philadelphia roots of biophysical research.

6. Monday, March 5, 2018 - Class Choice

This class will respond to students' interests. During the first week of the course, the instructor will survey participants and design a class that addresses some of their interests and questions.

Monday, March 12, 2018 – make-up class (if needed)

Readings

No texts or books will be required. The professor will provide handouts and a comprehensive bibliography as needed.

Paul J. Angiolillo is Professor of Physics at Saint Joseph's University, where he received a BS in Physics. He then attended the University of Pennsylvania and obtained an MS and PhD in Molecular Biophysics at the prestigious Eldridge Reeves Johnson Research Foundation. After working in the private sector, he taught physics at the University of the Sciences in Philadelphia. He joined the Department of Physics at Saint Joseph's University in 2000 and served as Chair of the department from 2007 to 2015. Dr. Angiolillo has an active research program in the area of materials physics. He specifically studies charge and spin dynamics in conjugated organic electronic materials, and has published extensively in this area. He has been a member of the Wagner faculty since 2002.

This course is offered by the **Wagner Free Institute of Science** in cooperation with the Free Library of Philadelphia. Located at 1700 W. Montgomery Avenue in Philadelphia, the Wagner is dedicated to providing free education in science. For more information about the Wagner and its programs, please check the website www.wagnerfreeinstitute.org or call 215-763-6529.